

December 19, 1997

EAs 96-397; 97-375; 97-559

Mr. Michael B. Sellman, President
Maine Yankee Atomic Power Company
P. O. Box 408
Wiscasset, Maine 04578

SUBJECT: APPARENT VIOLATIONS STEMMING FROM NRC OFFICE OF
INVESTIGATIONS REPORT NOS. 1-95-050, 1-96-025, AND 1-96-043

Dear Mr. Sellman:

This refers to the results of three investigations conducted by the NRC's Office of Investigations (OI) concerning (1) the adequacy of your facility's small break loss-of-coolant accident (SBLOCA) emergency core cooling system (ECCS) analyses, (2) your submittal to the NRC of inaccurate information pertaining to the capacity of the facility's atmospheric steam dump valves, and (3) a failure to perform station test procedures as required by facility technical specifications. The timeframe for these investigations spanned from December 1995 through October 1997. The synopses of the referenced investigation reports are provided as Enclosures 1 through 3.

With respect to the first matter, based upon a technical review and the results of the NRC Office of Investigations (OI) Report No. 1-95-050 pertaining to your SBLOCA analyses, the NRC identified several apparent violations of NRC requirements, which are provided as Enclosure 4. It appears that Maine Yankee Atomic Power Co. (MYAPCo) failed to use the SBLOCA analysis required by facility technical specifications effective November 18, 1991, to determine core operating limits for Cycle 12 and Cycle 13 operations, and that MYAPCo provided inaccurate information material to the NRC in facility Core Operating Limits Reports, which stated that MYAPCo had used the analytical methods specified by the facility technical specifications to determine operating limits for Cycle 12 and Cycle 13. It appears that carelessness on the part of your staff contributed to these apparent violations.

In addition, in apparent violation of 10 C.F.R. § 50.46(a), MYAPCo used unacceptable evaluation models to determine ECCS performance for Cycle 14 operations and in the Core Performance Analysis Reports (CPARs) submitted to the NRC to support MYAPCo's reload analyses for Cycle 14 and Cycle 15. Specifically, the analyses were not capable of acceptably calculating ECCS performance for the portion of the break spectrum between 0.35 ft² and at least 0.6 ft². Thus, it was not possible to confirm that the limiting break had been identified and that the ECCS was capable of mitigating the most severe postulated accident. In addition, it appears that MYAPCo maintained a materially incomplete and inaccurate Final Safety Analysis Report and submitted materially inaccurate information to the NRC in that the associated Cycle 14 and Cycle 15 Core Performance Analysis Reports did not reveal this inability to analyze the complete break spectrum, in violation of 10 C.F.R. § 50.9(a). It also appears that MYAPCo used an unacceptable ECCS evaluation model for Cycle 14 operations and in the reload analyses for Cycle 14 and Cycle 15 in violation of 10 C.F.R. § 50.46(a), in that the SBLOCA analysis incorrectly calculated penetration factors and misapplied the Alb-Chambre correlation, thus overpredicting core cooling and overstating the

conservatism of the evaluation model. Finally, it appears that MYAPCo used an unacceptable "Best Estimate" SBLOCA analysis, in violation of 10 C.F.R. § 50.46(a), to calculate ECCS performance in connection with a 10 C.F.R. § 50.59 analysis of the effects of a reduction in steam generator pressure.

Although the analyses involved in the apparent violations discussed in the preceding paragraph were performed by your contractor, Yankee Atomic Electric Company (YAEC), it is apparent, based on the NRC technical review and investigation, that MYAPCo's oversight of YAEC activities was not sufficient to ensure compliance with regulatory requirements. In particular, it appears that during Cycle 14 operations it could not be determined whether the ECCS were capable of mitigating the most severe postulated accident. These apparent violations collectively represent a potentially significant lack of attention or carelessness toward licensed responsibilities and a failure to conduct adequate oversight of a vendor, resulting in the use of services of defective or indeterminate quality.

With respect to the second matter, based on the information developed by OI Report No. 1-96-025, it appears that, in violation of NRC requirements, MYAPCo willfully provided materially inaccurate information regarding the capacity of the Atmospheric Steam Dump Valve (ASDV) to the NRC in a March 1986 submittal of the Procedures Generation Package (PGP), which incorporated by reference revised Emergency Operating Procedures (EOPs). Facility personnel knew at the time of the 1986 submittal of the PGP that the ASDV had a capacity of 2 1/2%, and not 5% as reflected in the submittal. The apparent violation is provided as Enclosure 5.

With respect to the third matter, based on information developed by OI Report No. 1-96-043, it appears that MYAPCo willfully violated Technical Specification 5.8.2 and 10 C.F.R. § 50.9(a). Work orders specified that specific contacts be verified as open with a volt-ohm meter (VOM). The field engineers performing the tests, however, obtained a quantifiable electrical resistance value, indicating a problem. Instead of stopping the test and reconciling the discrepancy, the engineers documented that they verified open contacts using the VOM, when, in actuality, they visually verified that the contacts were open. The apparent violations are provided as Enclosure 6.

Based on the extensiveness of the investigations, the NRC does not consider that further information is necessary to make an informed enforcement decision. However, enforcement action will not be taken for these apparent violations until you have been provided an opportunity to either (1) respond to the apparent violations described above within thirty days or (2) request a predecisional enforcement conference. Concurrently with this letter, the NRC staff is issuing a Demand for Information (Demand) to YAEC and to Duke Engineering & Services Co. (DE&S) (Enclosure 7). The Demand details the results of the NRC's investigation into the ECCS matters discussed herein and requires that YAEC and DE&S explain why the NRC should permit any NRC licensee to use their services to perform Loss-of-Coolant Accident analyses or any safety-related analyses to meet NRC requirements. Should you elect to request an enforcement conference, it is requested that you bring responsible personnel from YAEC and/or DE&S. As part of any response or presentation at a predecisional enforcement conference, you should address why the NRC should not consider that certain apparent violations described herein were not the result of willfulness, deliberateness and/or careless disregard, on the part of your personnel. Consistent with the Enforcement Policy, a conference, if held, would be closed to public observation since the findings are based on Office Of Investigation reports that have not been publicly disclosed. Please contact R. Bellamy, Chief, Decommissioning and LAB Branch, at (610) 337-5200 within 7 days of the date of this letter to notify the NRC of your intended response.

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Please be advised that the enclosed apparent violations are in draft and may change substantially upon further review of your response or your presentation at a predecisional enforcement conference. You will be advised by separate correspondence of the results of our deliberations on this matter.

In accordance with 10 C.F.R. § 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and your response will be placed in the NRC Public Document Room (PDR). To the extent possible, your response should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction.

Sincerely,

Hubert J. Miller
Regional Administrator

Docket No. 50-309
License No. DPR-36

Enclosures:

- (1) Synopsis of OI Report 1-95-050
- (2) Synopsis of OI Report 1-96-025
- (3) Synopsis of OI Report 1-96-043
- (4) Apparent Violations Associated with SBLOCA ECCS Analysis
- (5) Apparent Violation Associated with ASDV
- (6) Apparent Violations Associated with Safety System Logic Testing
- (7) Demand for Information (EA 97-387)

Maine Yankee Atomic
Power Company

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cc w/encls:

D. Davis, President, Yankee Atomic Electric Company (YAEC)
G. Leitch, Vice President, Operations, MYAPCo
M. Meisner, Vice President, Licensing and Regulatory Compliance, MYAPCo
R. Fraser, Director of Engineering
P. Anderson, Project Manager, YAEC
W. Odell, Director of Operations
M. Ferri, Director of Decommissioning
L. Diehl, Manager of Public and Governmental Affairs, MYAPCo
J. Ritsher, Ropes and Gray
P. Dostie, State of Maine Nuclear Safety Inspector
U. Vanags, State of Maine Nuclear Safety Advisor
C. Brinkman, Combustion Engineering, Inc.
W. Meinert, Nuclear Engineer, (name of company)
First Selectmen of Wiscasset
State of Maine Planning Officer - Nuclear Safety Advisor
State of Maine, SLO Designee
State of Maine Planning Officer - Executive Department
R. Shadis, Friends of the Coast

ENCLOSURE 1

SYNOPSIS OF OFFICE OF INVESTIGATIONS REPORT NO.1-95-50, "MAINE YANKEE ATOMIC POWER STATION: ALLEGED DELIBERATE FAILURE TO COMPLY WITH NRC REQUIREMENTS REGARDING THE ADEQUACY OF THE PLANTS EMERGENCY CORE COOLING SYSTEM AND MATERIAL OMISSIONS BY THE LICENSEE," DATED SEPTEMBER 6, 1996

On December 6, 1995, the Nuclear Regulatory Commission's (NRC) Office of Investigations (OI), Region I, initiated this investigation in response to anonymous allegations that were made public in early December 1995, regarding, among other things, the adequacy of the Emergency Core Cooling System (ECCS) at the Maine Yankee (MY) Atomic Power Station, Wiscasset, Maine. Generally, it was alleged that Maine Yankee Atomic Power Company (MYAPCo), in concert with Yankee Atomic Electric Company (YAEC), knowingly performed inadequate small break loss-of-coolant accident (SBLOCA) analyses of the ECCS and deliberately misrepresented the analyses to the NRC. Specifically, the OI investigation sought to determine: (1) whether MYAPCo deliberately failed to implement, for fuel Cycles 12 and 13, the RELAP5YA SBLOCA analysis, as accepted and approved by the NRC in a January 1989 Safety Evaluation Report (SER); and (2) if the RELAP5YA computer code was deliberately implemented in June 1993, for Cycle 14, in a manner that did not conform with the SER and the requirements of 10 C.F.R. 50.46.

Based on the evidence developed during this investigation, OI concludes that (1) for the period June 1990 through May 1993 (during Cycles 12 and 13), MYAPCo willfully failed to implement an acceptable EM (the RELAP5YA SBLOCA analysis approved by the NRC via a January 1989 SER) as required by 10 C.F.R. 50.46; and (2) MYAPCo/YAEC willfully failed to implement the RELAP5YA EM, in the June 1993 analysis for cycle 14, in a manner consistent with the NRC's January 1989 SER and the requirements of 10 C.F.R. 50.46.

ENCLOSURE 2

SYNOPSIS OF OFFICE OF INVESTIGATIONS REPORT NO.1-96-025, "MAINE YANKEE ATOMIC POWER STATION: INACCURATE INFORMATION PROVIDED TO NRC REGARDING THE CAPACITY OF THE ATMOSPHERIC STEAM DUMP," DATED JUNE 27, 1997

This investigation was initiated by the Nuclear Regulatory Commission (NRC) Office of Investigations (OI), Region I, on July 11, 1996, to determine if Maine Yankee Atomic Power Company (MYAPCo) willfully provided inaccurate information regarding the capacity of the Atmospheric Steam Dump valve (ASDV) to the NRC in a March 1986 submittal of the Procedures Generation Package (PGP), which incorporated, by reference, revised Emergency Operating Procedures (EOPs).

Based upon the evidence developed during this investigation, it is concluded that MYAPCo willfully provided inaccurate information regarding the capacity of the ASDV to the NRC in the 1986 submittal of the PGP.

ENCLOSURE 3

SYNOPSIS OF OFFICE OF INVESTIGATION REPORT NO. 1-96-043, "MAINE YANKEE ATOMIC POWER STATION: FALSIFICATION OF TEST RECORDS BY LICENSEE ENGINEERS," DATED OCTOBER 31, 1997

This investigation was initiated by the Nuclear Regulatory Commission (NRC), Office of Investigations (OI), Region I, on November 14, 1996, to determine whether two electrical engineers (EEs) of the Maine Yankee (MY) Atomic Power Company, working at the MY Atomic Power Station, Wiscasset, Maine, falsified separate test records in August 1996, which involved the electrical testing of equipment important to safety.

Based on the evidence developed during this investigation, it is concluded that the two EEs falsified test records by deliberately violating technical specification required procedures that controlled safety related testing. Specifically, OI's investigation determined that the EEs failed to conduct an electrical test as written in an approved work order, initialed the test record giving the appearance that the test was satisfactorily conducted as written, and failed to note the change in the test method that was actually implemented.

ENCLOSURE 4

APPARENT VIOLATIONS ASSOCIATED WITH ECCS ANALYSES (OI REPORT NO. 1-95-050)

A. APPARENT VIOLATIONS RELATING TO OPERATING CYCLE 12

1. Technical Specification (TS) 5.14.2, "Core Operating Limits Report," for the Maine Yankee Atomic Power Station (MYAPS) became effective November 18, 1991, and requires, in part, that analytical methods used to determine operating limits shall be limited to those previously reviewed and approved by NRC, as listed by TS 3.10. TS.3.10 lists a Small-Break Loss-of-Coolant (SBLOCA) analysis, "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3, dated October 1982" (RELAP5YA). TS.3.10. does not specify any SBLOCA analytical method developed by Combustion Engineering Corporation (CE) for SBLOCA analysis.

However, between November 18, 1991, and February 14, 1992 (during Cycle 12 operations), Maine Yankee Atomic Power Company did not determine operating limits for Cycle 12 operations using the RELAP5YA SBLOCA analysis required by TS 5.14.2. In fact, a CE SBLOCA code was used to prepare the reload analysis, as stated in the Core Performance Analysis Report for Cycle 12 at Section 5.5.5.3.

2. 10 C.F.R. § 50.9(a) requires, in part, that information provided to the Commission by a licensee shall be complete and accurate in all material respects.

However, on December 18, 1991, Maine Yankee Atomic Power Company (MYAPCo) provided to the Commission MYAPCo's Cycle 12 Core Operating Limits Report (COLR), which contained inaccurate information material to the NRC. The COLR stated that MYAPCo used analytical methods listed in TS 5.14 to determine operating limits. In fact, MYAPCo used the Combustion Engineering Small Break Loss-of-Coolant Accident (SBLOCA) analytical method, which was not listed in TS 5.14. The SBLOCA analytical method listed by TS 5.14 is "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3, dated October 1982" (RELAP5YA). This inaccurate information was material to the NRC because it was a representation that RELAP5YA, which had been approved for application to Maine Yankee Atomic Power Station pursuant to the Three Mile Island Action Plan, Item II.K.3.30 (NUREG 0737), had been used in concert with other approved codes to establish core operating limits for Cycle 12 operations.

B. APPARENT VIOLATIONS RELATING TO OPERATING CYCLE 13

1. Technical Specification (TS) 5.14.2, "Core Operating Limits Report," for the Maine Yankee Atomic Power Station (MYAPS) requires, in part, that analytical methods used to determine operating limits shall be limited to those previously reviewed and approved by NRC, as listed by TS 3.10. TS.3.10 specifies a Small-Break Loss-of-Coolant (SBLOCA) analysis, "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3, dated October 1982" (RELAP5YA). TS.3.10. does not specify any SBLOCA analysis produced by Combustion Engineering Corporation (CE).

However, between April 19, 1992 and July 7, 1993 (during Cycle 13 operations), Maine Yankee Atomic Power Company did not determine operating limits for Cycle

13 operations using the RELAP5YA SBLOCA analysis required by TS 5.14.2. In fact, a CE SBLOCA code was used to prepare the reload analysis, as stated in the Core Performance Analysis Report for Cycle 13 at Section 5.5.5.3.

2. 10 C.F.R. § 50.9(a) requires, in part, that information provided to the Commission by a licensee shall be complete and accurate in all material respects.

However, on April 7, 1992, Maine Yankee Atomic Power Company (MYAPCo) provided to the Commission MYAPCo's Cycle 13 Core Operating Limits Report (COLR), which contained inaccurate information material to the NRC. The COLR stated that MYAPCo used analytical methods listed in TS 5.14 to determine operating limits. In fact, MYAPCo used a Combustion Engineering Small-Break Loss-of-Coolant (SBLOCA) analysis, which was not listed in TS 5.14. The SBLOCA analysis listed by TS 5.14 is "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3, dated October 1982" (RELAP5YA). This inaccurate information was material to the NRC because it was a representation that RELAP5YA, which had been approved for application to MYAPS pursuant to the Three Mile Island Action Plan, Item II.K.3.30 (NUREG 0737), had been used to establish core operating limits for Cycle 13 operations.

C. APPARENT VIOLATIONS RELATING TO INABILITY TO ANALYZE ENTIRE BREAK SPECTRUM FOR CYCLE 14

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated.

10 C.F.R. Part 50, Appendix K, Section II.4. requires that to the extent practicable, predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information.

However, from October 14, 1993, through January 25, 1995 (during Cycle 14 operations), and in the Cycle 14 Core Performance Analysis Report (CPAR) submitted August 25, 1993, Maine Yankee Atomic Power Company (MYAPCo) failed to calculate a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents were calculated, because there was a portion of the small-break spectrum between .35 ft² and at least .6ft² for which no acceptable code was capable of calculating cooling performance or reliably calculating cooling performance. MYAPCo calculated Small-Break Loss-of-Coolant Accident (SBLOCA) ECCS performance up to the .35ft² break size, using the code described in "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA) and the plant-specific RELAP5YA SBLOCA evaluation model described in YAEC-1868, "Maine Yankee Small Break LOCA Analysis" (both of which were described as an Appendix K approach to RELAP5YA). The RELAP5YA SBLOCA evaluation model documented in YAEC-1868 was incapable of calculating ECCS performance for breaks of and greater than 0.35 ft² because the code terminated after the safety injection tank

actuation due to numerical convergence errors for the break of $.35\text{ft}^2$. MYAPCo calculated Large-Break Loss-of-Coolant (LBLOCA) ECCS Performance with the LBLOCA analysis described in YAEC-1160, "Application of Yankee WREM-Based Generic PWR ECCS Evaluation Model to Maine Yankee", dated July 1978 (WREM). Although the WREM LBLOCA evaluation model was demonstrated in 1996 to be capable of calculating ECCS performance down to the $.6\text{ft}^2$ break size, the evaluation model was not used to calculate ECCS performance in the small-break region for the Cycle 14 CPAR, and would not have been acceptable to calculate ECCS performance for break sizes in the small-break region of 0.6ft^2 and above because the evaluation model was not compared to applicable experimental data to demonstrate its reliability in calculating ECCS performance in the small-break region.

D. APPARENT VIOLATIONS RELATING TO INABILITY TO ANALYZE ENTIRE BREAK SPECTRUM FOR CYCLE 15

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated.

10 C.F.R. Part 50, Appendix K, Section II.4. requires that to the extent practicable, the predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information.

However, in the Cycle 15 Core Performance Analysis Report (CPAR) submitted December 1, 1995, Maine Yankee Atomic Power Company (MYAPCo) failed to calculate a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents were calculated, because there was a portion of the small-break spectrum between $.35\text{ft}^2$ and at least $.6\text{ft}^2$ for which no acceptable code was capable of calculating cooling performance or reliably calculating cooling performance. MYAPCo calculated Small-Break Loss-of-Coolant Accident (SBLOCA) ECCS performance up to the $.35\text{ft}^2$ break size, using the code described in "YAEC 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA) and the plant-specific RELAP5YA SBLOCA evaluation model described in YAEC-1868, "Maine Yankee Small Break LOCA Analysis" (both of which were described as an Appendix K approach to RELAP5YA). The RELAP5YA SBLOCA evaluation model documented in YAEC-1868 was incapable of calculating ECCS performance for breaks of and greater than 0.35ft^2 because the code terminated after the safety injection tank actuation due to numerical convergence errors for the break of $.35\text{ft}^2$. MYAPCo calculated Large-Break Loss-of-Coolant (LBLOCA) ECCS Performance with the LBLOCA analysis described in YAEC-1160, "Application of Yankee WREM-Based Generic PWR ECCS Evaluation Model to Maine Yankee", dated July 1978 (WREM). Although the WREM LBLOCA evaluation model was demonstrated in 1996 to be capable of calculating ECCS performance down to the $.6\text{ft}^2$ break size, the evaluation model was not used to calculate ECCS performance in the small-break region for the Cycle 15 CPAR, and would not have been acceptable to calculate ECCS performance for break sizes in the small-break region of 0.6ft^2 and above because the evaluation model was not compared to applicable

experimental data to demonstrate its reliability in calculating ECCS performance in the small-break region.

E. INCOMPLETE AND INACCURATE CORE PERFORMANCE ANALYSIS REPORTS

10 C.F.R. § 50.9(a) requires, in part, that information provided to the Commission by an applicant for a license or a licensee or information required by statute or the Commission's regulations to be maintained by the licensee or the applicant shall be complete and accurate in all material respects.

10 C.F.R. § 50.71(e)(6) requires each person licensed to operate a nuclear power reactor pursuant to 10 C.F.R. § 50.21 or 50.22 to retain the updated Final Safety Analysis Report (FSAR) until the Commission terminates the license.

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model and must be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents are calculated.

10 C.F.R. Part 50, Appendix K, Section II.4. requires that to the extent practicable, the evaluation model, or portions thereof, shall be compared with applicable experimental information.

However, MYAPCo's Final Safety Analysis Report was not complete and accurate in all material respects. The FSAR incorporates Core Performance Analysis Reports (CPARs) as Appendix D. The CPARs used by MYAPCo to support its Cycle 14 and Cycle 15 operations were submitted to the NRC on August 25, 1993, and on December 1, 1995, respectively, and relied upon an Emergency Core Cooling Performance (ECCS) Small-Break Loss-of-Coolant (SBLOCA) evaluation model described in YAE-1868, "Maine Yankee Small Break LOCA Analysis" (YAE-1868), and incorporated YAE-1868, which was not complete and accurate in all material respects. YAE-1868 described the plant-specific evaluation model of the ECCS code described in "YAE 1300P, RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA). Both YAE-1868 and RELAP5YA were Appendix K approaches to calculation of ECCS performance. YAE-1868 included the following statements: "Evaluations [of ECCS performance] were performed over a complete range of break sizes"; "The base analysis [of ECCS performance] hence consisted of a complete matrix of break sizes"; and "The largest break size analyzed for Maine Yankee in this analysis was 0.35 ft². This covered a sufficient range to identify the limiting SBLOCA condition for Maine Yankee." These statements are incomplete and inaccurate in that the RELAP5YA evaluation model described by YAE-1868 failed to calculate a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the most severe postulated loss-of-coolant accidents were calculated, because there was a portion of the small-break spectrum between .35 ft² and at least .6ft² for which no acceptable code was capable of calculating or reliably cooling performance. The RELAP5YA SBLOCA analysis described in YAE-1868 was incapable of calculating ECCS performance for breaks of and greater than 0.35 ft² because the code terminated after the safety injection tank actuation due to numerical convergence errors for the break at .35ft². MYAPCo calculated Large-Break Loss-of-Coolant (LBLOCA) ECCS Performance with the

LBLOCA analysis described in YAEC-1160, "Application of Yankee WREM-Based Generic PWR ECCS Evaluation Model to Maine Yankee", dated July 1978 (WREM). Although the WREM LBLOCA evaluation model was demonstrated in 1996 to be capable of calculating ECCS performance down to the .6ft² break size, the evaluation model was not used to calculate ECCS performance in the small-break region for the Cycle 14 and 15 CPARs, and would not have been acceptable to calculate ECCS performance for break sizes in the small-break region of 0.6ft² and above because the evaluation model was not compared to applicable experimental data to demonstrate its reliability in calculating ECCS performance in the small-break region. The inaccurate and incomplete statements in YAEC-1868 were material to the NRC because they concealed that the complete break spectrum had not been analyzed and that, contrary to the requirements of 10 C.F.R. § 50.46(a)(1), there was a portion of the break spectrum between .35ft² and at least .6ft² for which no acceptable code was capable of calculating cooling performance or reliably calculating cooling performance.

F. APPARENT VIOLATION RELATED TO IMPROPER APPLICATION OF ALB-CHAMBRE CORRELATION FOR CYCLE 14

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model.

However, from October 14, 1993, through January 25, 1995 (during Cycle 14 operations), and in the Cycle 14 Core Performance Analysis Report (CPAR) submitted August 25, 1993, MYAPCo calculated ECCS performance for SBLOCAs with an unacceptable evaluation model. MYAPCo used the ECCS code described in YAEC-1300P, "RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA), and the plant-specific RELAP5YA SBLOCA evaluation model described in YAEC-1868, "Maine Yankee Small Break LOCA Analysis" (YAEC-1868). RELAP5YA as applied was not an acceptable evaluation model because the nodalization model of YAEC-1868 incorrectly applied the Alb-Chambre correlation, which caused incorrect calculations of penetration factors and the cross flow resistance factor, and which as a result unacceptably overpredicted cooling performance and overstated the conservatism of RELAP5YA.

G. APPARENT VIOLATION RELATED TO IMPROPER APPLICATION OF ALB-CHAMBRE CORRELATION FOR CYCLE 15

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model.

However, in the Cycle 15 Core Performance Analysis Report (CPAR) submitted December 1, 1995, MYAPCo calculated ECCS performance for SBLOCAs with an unacceptable evaluation model. MYAPCo used the ECCS code described in YAEC-1300P, "RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA), and the plant-specific RELAP5YA SBLOCA evaluation model described in YAEC-1868, "Maine Yankee Small Break LOCA Analysis" (YAEC-1868). RELAP5YA as applied was not an acceptable evaluation model because the nodalization model of YAEC-1868 incorrectly applied the Alb-Chambre correlation, which caused incorrect calculations of penetration factors and the

cross flow resistance factor, and which as a result unacceptably overpredicted cooling performance and overstated the conservatism of RELAP5YA.

H. APPARENT VIOLATION RELATING TO ANALYSIS OF REDUCED STEAM GENERATOR PRESSURE FOR CYCLE 14

10 C.F.R. § 50.46(a)(1) requires, in part, that emergency core cooling system (ECCS) performance must be calculated with an acceptable evaluation model. 10 C.F.R. § 50.46(a)(1)(ii) provides that an ECCS evaluation model may be developed in conformance with the required and acceptable features of Appendix K ECCS Evaluation Models.

However, in a January 1993 analysis of a decrease in steam generator pressure, performed pursuant to the requirements of 10 C.F.R. § 50.59, MYAPCo used an unacceptable evaluation model to calculate Small-Break Loss-of-Coolant (SBLOCA) ECCS performance. MYAPCo used a Best Estimate (BE) plant-specific evaluation model (described in an August 1, 1990, report produced by Yankee Atomic Electric Company) to implement the SBLOCA code described in YAEC 1300P, "RELAP5YA: A Computer Program for Light Water Reactor System Thermal-Hydraulic Analysis, Volumes 1, 2, 3," dated October 1982 (RELAP5YA). In January 1989 the NRC transmitted its Safety Evaluation Report approving RELAP5YA for application to Maine Yankee Atomic Power Station as an Appendix K model, not as a BE model. Furthermore, contrary to 10 C.F.R. Part 50, Appendix K, the BE evaluation model calculated decay heat with the 1979 ANS Standard rather than the 1971 ANS Standard plus 20 percent, and calculated the two-phase critical flow with the RELAP5YA mechanistic model rather than the Moody critical flow model.

ENCLOSURE 5

APPARENT VIOLATION ASSOCIATED WITH PROVIDING INACCURATE INFORMATION TO THE NRC RELATIVE TO THE CAPACITY OF THE ATMOSPHERIC STEAM DUMP VALVE (OI REPORT NO.1-96-025)

Section 186 of the Atomic Energy Act of 1954, as amended, requires licensees to ensure that all submissions to the NRC be complete and accurate in all material respects.

However, the licensee submitted a Procedures Generation Package on March 18, 1986, which contained a materially inaccurate statement. Specifically, the licensee stated that the Atmospheric Dump Valve (ADV) had a 5% bypass capacity, when in fact it had a 2½ % capacity. The submission was made to demonstrate conformance to NUREG-0737, "Clarification of TMI Action Plan Requirements", Action Item I.C.1, "Guidance for the Evaluation and Development of Procedures for Transients and Accidents". The inaccurate statement was material to the NRC because the relief capacity relates to the ability to adequately achieve core cooling.

ENCLOSURE 6

APPARENT VIOLATIONS ASSOCIATED WITH SAFETY SYSTEM LOGIC TESTING (OI REPORT NO.1-96-043)

- A. Technical Specification 5.8.2 states, in part, that written procedures be established, implemented, and maintained to control, among other things, activities concerning testing of safety related equipment.

Item 12 of Attachment C to Procedure No. 0-16-3, "Work Order Process," defines a Functional Test Instruction (FTI) as instructions that define the evolutions or operations necessary to prove functionality or operability of a component, system, or structure.

Precaution 3.1 of Work Order 96-02928-00, Attachment A, "Functional Test for P-14A/S on A Train SIAS and Bus 5 Undervoltage," and Work Order 96-02929-00, Attachment A, "Functional Test for P-14 B/S on B Train SIAS and Bus 6 Undervoltage," states that if any step cannot be completed as specified in the FTI, then the Field Engineer must be contacted and any deviation from this FTI must be authorized in accordance with Procedure 0-16-3.

Deviations to FTIs are permitted through the use of Minor Technical Changes (MTC) as described in Item 13 of Attachment C to Procedure No. 0-16-3.

However, on August 22, 1996, Step 5.3.3 of WO 96-02928-00 and WO 96-02929-00 could not be performed as written, and the licensee failed to resolve the discrepancy by making a Minor Technical Change. Specifically, Step 5.3.3 provided that at Main Control Board (MCB), Section C, open circuit continuity be verified at 86-RASA-2(YAF) using a volt-ohm meter (VOM) across the 5-5C contacts. The field test engineers could not verify the open contacts with a VOM because of resistance in the circuit caused by a bulb and resistor wired into the circuit. Instead of making a MTC to permit visual verification, the field engineers verified open circuit continuity visually and signed Step 5.3.3 as satisfactorily completed.

- B. 10 C.F.R. § 50.9(a) provides in part that information required by the Commission's regulations to be maintained by the licensee to be complete and accurate in all material respects.

10 C.F.R. Part 50, Appendix B, Criterion XVII, "Quality Assurance Records," requires, in part, that records of tests affecting quality be maintained.

However, on August 22, 1996, the licensee created test records that were materially inaccurate. Step 5.3.3 of WO 96-02928-00 and WO 96-02929-00 provided that at MCB, Section C, open circuit continuity be verified at 86-RASA-2(YAF) using a volt-ohm meter (VOM) across the 5-5C contacts. The field test engineers could not verify the open contacts with a VOM because of resistance in the circuit caused by a bulb and resistor wired into the circuit. Instead, the field test engineers verified open circuit continuity visually and signed Step 5.3.3 as satisfactorily completed. These inaccuracies were material because the tests concerned functionality or operability of safety-related components.